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10/824,107	04/14/2004	Wayne O. Duescher	638.014US1	7549

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EXAMINER	
LAZORCIK, JASON L	
ART UNIT	**PAPER NUMBER**
1731	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/29/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/824,107	DUESCHER, WAYNE O.	
	Examiner	Art Unit	
	Jason L. Lazorcik	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 October 2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 2-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 2-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The originally submitted specification provides adequate antecedent basis for applicants amendment wherein the chemical agents are selected from the group consisting of "gas inducing materials" as set forth in paragraph [0304] and for "hollow sphere forming mixtures" as set forth in paragraph [0394]. The disclosure <u>does not</u> provide antecedent basis for the limitation as presented wherein the mixture solution comprises "foaming agents", "gas-forming substances", and/or "blowing agents" such that one of ordinary skill in the art at the time of the invention would be reasonably apprised of the details of the invention to enable one to make and/or use the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, 3, 6, 8, 11, 12, 15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Berg (5,984,988). Briefly, berg teaches a method of manufacturing abrasive particles having specific, pre-determined shapes. Specifically with respect to Claim 2 Berg teaches;

1. "Providing a mold having a first surface having an opening to a mold cavity having a specified shape" (Column 2, Lines 57-58). Further, said mold should have "at least one cavity, preferably a plurality of cavities"(C6, L1-3), and should be made from a relatively thin aluminum or stainless steel sheet or belt" (C6, L6-9). It is here understood that the mold as described by Berg is equivalent to the "Cell Sheet" in the immediate claim and that the "plurality" of cavity is equivalent to the claimed array of "cell sheet through holes" which are further understood to inherently present a "cross sectional area". Further, the reference to the mold as being relatively thin indicates that said mold has a "nominal thickness". The cavities having both a thickness and cross sectional area, inherently define a "cell sheet volume" by the product of the two aforementioned values.
2. "preparing a dispersion containing particles that can be converted into alpha alumina in a liquid, which liquid comprises a volatile component, **preferably water**" (C4, L55-57) and the particles are preferably alpha aluminum oxide monohydrate (boehmite) (C4, L65-66). The described

dispersion is hereby understood as equivalent to the claimed "**liquid mixture solution**" which is contains by **an inorganic oxide**, present as aluminum oxide monohydrate in the immediate context, **and water**.

3. "introducing the dispersion into cavities" (C6, L48-50) which is understood to be equivalent to filling the through holes with the **liquid mixture solution** to form a mixture volume. Berg later makes reference to the "filled cavities in the belt" (C9, L55) which is understood to mean that the volume defined by said cavity is filled with the dispersion or alternatively that the volume of mixture solution in the mixture volume equals the cell sheet volume as claimed.

As correctly pointed out by Applicant in response to the Office Action dated July 18, 2006, Berg teaches that "it is preferred that a sufficient amount of volatile component be removed from the dispersion so that the precursors of the abrasive particles can be easily removed from the cavities of the mold. Typically, up to 40% of the liquid is removed from the dispersion in this step." (column 7, lines 20-25) From this statement, it is clear that <u>under typical processing conditions</u> Berg teaches ejecting a dispersion form the cell sheet which contains an appreciable amount (at least 60%) of the initial water content as set forth above. Further where Berg teaches a most preferred <u>initial</u> liquid mixture containing 50-60% volatile (e.g. water) then even after removal of 40% of the water, the liquid mixture

volumes still contain nearly 30% water by weight ((0.40*0.5 volatile)/[(0.40*0.5 volatile)+(0.5 solids)]=0.28). Since an appreciable amount of water remains in the ejected liquid is therefore clear from the Berg teachings that under typical processing conditions, the "<u>liquid</u> mixture volumes" are ejected from the cell sheet as claimed.

4. "removing the precursors of the abrasive particles from the mold cavities...by applying a low pressure to force them out of the cavities" (C7, L26-34). With respect to the immediate claim, the "precursors of the abrasive particles" are held equivalent to the claimed "mixture volume" before removal from the mold and to the "mixture solution lump entities" after removal from the mold. Additionally the described applied pressure force is interpreted as being equivalent the claimed "impinging jet of fluid" used to dislocate the mixture volumes from the mold.
5. Berg further indicates that "when the precursors of the abrasive particles are removed from the mold, some of their edges may...become rounded" (C7, L40-43). This rounding effect or deformation of the precursors of the abrasive particles in the extreme case would produce an approximately spherical body and is understood to inherently occur from a force such as surface tension acting upon the body of said particle. Although presented in the immediate reference as a situation to be avoided or minimized, this disclosure is nevertheless read on the immediate claim as shaping the

mixture solution lump entities into independent spherical entities through a force acting upon said lump entities.

Evidence of the inherent impact of surface tension upon slurries in the above solids concentration range has recently been reported by Zhai et. al. (Materials Science and Engineering A, Vol 392(1-2), 15 Feb 2005, Pg 1-7). The reference clearly shows (see table 2) that slurry dispersions with up to 70% solids concentration by weight maintain sufficient fluidity to by shaped into spherical particles by the effects of surface tension. Therefore, even after removal of 40% of the water from the initial slurry composition (as set forth in the suggested operating protocol by Berg), the Zhai reference shows that the remaining liquid mixture element comprising approximately 70% solids would be subject to spherical rounding by surface tension forces.

In addition to the rounding of non-spherical particles, Berg clearly demonstrates the formation of "Circular" particles in the instant Fig 6. Further and more importantly, Berg teaches that "the (mold) cavity may be the inverse of even other solid geometric shapes, such as, for example, pyramidal, frusto-pyramidal, truncated spherical, truncated spheroidal, conical, and frusto-conical" (Column 6, lines 35-47). In accord with the broadest reasonable interpretation of the term "spherical" in the instant claim language, Bergs formation of

truncated <u>spherical</u> particles anticipates applicants formation of "independent spherical entities"

6. "Typically, the precursors of the abrasive particles will be dried (outside of the mold" (C7, L46-58) which is held equivalent to the claimed process of subjecting the independent spherical entities to a "solidification environment" to form "loose green beads". **Further by the above rationale, Berg teaches the formation of "spherical beads".**
7. Finally, it is indicated that the precursors of the abrasive particles are sintered to form the abrasive particles (C8, L8-10) which is understood to read on the claimed process of firing the loose green beads at high temperature to form the beads.

With respect to Claim 3, Berg indicates that the precursors of the abrasive particles are to be exposed to elevated temperature air in an "air circulating oven" (C9, L56). The above disclosure is read as equivalent to providing a solidification environment comprising elevated temperature air or other gas.

Regarding Claim 6, the immediate reference indicates (C6, L8) that the mold can be made from a "belt" which is understood to be equivalent to the claimed cell sheet wherein the two opposing ends of said sheet are joined to form a cell sheet continuous belt.

Concerning Claim 8, Berg indicates in a calcining step that the precursors of the abrasive particles are "generally heated to a temperature of from about 400°C to about

800°C" (C7, L64-65). This step is followed by sintering the precursors to form the abrasive particles wherein said sintering step occurs in a temperature range from about 1000°C to about 1650°C (C8, L8-24). The applicant indicates in the specification that;

> "Vitrification of the composite agglomerate or granule is avoided as the external surface of the composite would change into a continuous glassy state, thereby preventing the composite from having a porous external surface. Some example abrasive agglomerates using Aluminum oxide abrasive particles were fired at 700 degrees C. which produced a smooth, shiny agglomerate surface finish." (pg 10, ¶[0049])

It is therefore understood that the disclosed heating temperatures in the calining and sintering of the aluminum oxide particles as set forth by Berg are "sufficiently high to vitrify the bead exterior surface" and thereby producing glassy surfaces on the surface of the beads.

Claim 11 is anticipated by the combined rejections of Claim 1 and Claim 8 under 35 USC 102(b) above.

Claim 12 is anticipated by Berg in light of the rejection of Claim 11 and the argument set forth in the rejection of Claim 3 as presented above.

Claim 15 is anticipated by Berg in light of the rejection of Claim 11 and the argument set forth in the rejection of Claim 6 as presented above.

Claim 17 is anticipated by Berg in light of the rejection of Claim 11 and the argument set forth in the rejection of Claim 8 as presented above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) in view of Howard (3,916,584). Berg is discussed above with respect to Claims 2 and 11. Berg does not disclose the use of dehydrating liquid. As the applicant indicates in the body of the specification, the use of a dehydrating liquid in the processing of abrasive beads is commonly practiced and well known in the art;

> "Presently there are a number of methods used to manufacture abrasive beads...***Among the earliest processes of making beads*** is a process developed by Howard in U.S. Pat. No. 3,916,584 where he *poured a slurry mixture* (of abrasive particles mixed in a Ludox® solution of colloidal silica suspended in water) *into a dehydrating liquid* including various alcohols or alcohol mixtures or heated oils including peanut oil, mineral oil or silicone oil and stirred it." (Pg 6, ¶ [0022])

It would have been an obvious alteration for one of ordinary skill in the art at the time of the invention to incorporate the old and well know "dehydrating liquid" process as taught by Howard to the abrasive particle manufacture process as taught by Berg. This would be an obvious modification to the Berg process in order to prevent the ejected mixture lump solution entities or independent spherical entities from agglomerating into a larger mass during while being subjected to the solidification environment.

Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) in view of Eisenberg (4,393,021). Berg teaches the formation of cavities in a mold belt as previously indicated and that "the cavities can extend completely through the belt, such that the belt has a multiplicity of perforations therein" (C9, L33-34), However, the immediate reference makes no indication that said belt or "cell sheet" should be a woven screen. Eisenberg teaches the fabrication of abrasive grits by pressing or extruding a composite of abrasive grits with a binding medium through a mesh screen (C2, L42-46) or "endless sieve web" (C3, L12). It would be obvious to one of ordinary skill in the art attempting to reduce equipment fabrication costs associated with manufacturing a machined mold in the manner taught by Berg to substitute an "endless sieve web" or woven screen for said mold belt as taught by Eisenberg.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) in light of Culler (6,521,004) and the Quadro Engineering Incorporated Quadro® Comil® product description (http://www.quadro.com/3_milling/3_applications.asp). Berg teaches of a belt shaped

mold device for use in the manufacture of agglomerate abrasive particles. The immediate reference however fails to explicitly indicate that the mold should take the form of a disk shape having an annular pattern of cell sheet holes. Culler teaches of a perforated substrate (see Fig 4 excerpt below), broadly understood to be of a conical disk shape and presenting an annular pattern of cell sheet holes. Further by Cullers teachings, this perforated substrate is utilized in the fabrication of abrasive agglomerate particles. The particular apparatus presented by Culler is manufactured by Quadro Engineering Incorporated and is reported by said manufacturer to minimize blockages in the screen or perforations.

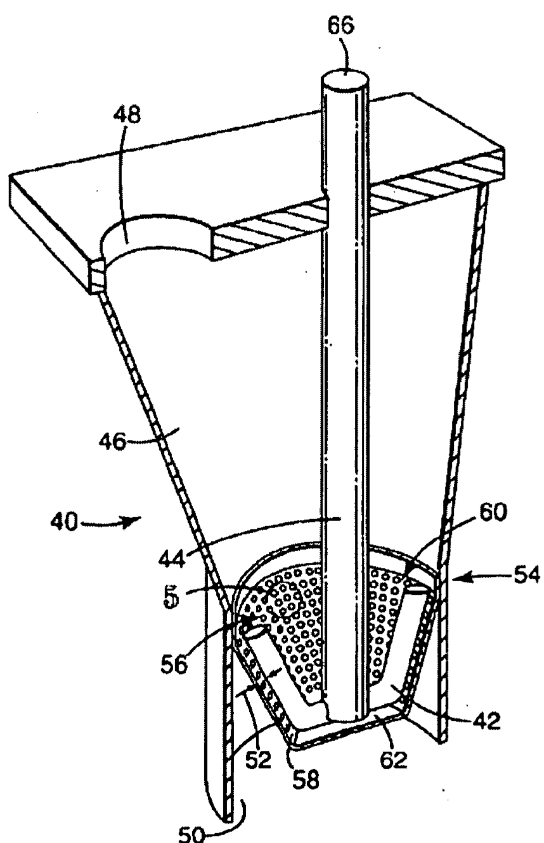


Fig. 4

It would be obvious to one of ordinary skill in the art to modify belt shaped mold taught by Berg with the disk shaped mold and impeller as taught by Culler. The aforementioned modification would be an obvious extension to the Berg process to one seeking to increase equipment operating time by minimizing cell sheet hole or screen blockages.

Claims 9 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) in view of Matthews (3,838,998). Specifically with respect to Claim 9, Berg discloses all of the elements of Claim 2 while failing to explicitly indicate that a **"chemical agent" selected from the presented group** should be incorporated into the mixture solution to provide spherical shaped hollow beads. Matthews teaches of a process incorporating both high and low temperature glass formers in an admix with water to form a slurry. Upon performing a dual heating cycle first at low temp which bloats the low temp glass former and then at high temperature which vitrifies the outer shell, Matthews prepares a hollow, spherical, and vitrified particle. In the instant case, the "admix" could be considered a **"hollow sphere forming mixture"** which provides for hollow particles. Matthews further indicates that "hollow microspheres are particularly advantageous as they contribute stiffness and strength yet often permit a reduction in weight of the ultimate product because of their stiffness and strength in proportion to their density" (C1, L26-31). It would be obvious to one of ordinary skill in the art seeking to prepare a hollow abrasive particle to incorporate a low temperature glass former into the mixture volume according to the teachings of Matthews into the process as outlined by Berg. The preparation of a hollow abrasive of the type taught by

the Berg-Matthews combination would be obvious to one seeking to retain the stiffness and abrasive properties of the abrasive particles while minimizing the particle density and therefore product weight.

Regarding Claim 10 and in light of the Claim 9 Rejection above, Berg indicates that the calcinated precursor particles are to be subjected to a temperature sufficient to sinter the particles as outlined in Claim 2 above. This disclosure is read in the immediate claim as firing the hollow beads at a temperature sufficiently high to vitrify the agglomerate exterior surfaces of said beads thereby resulting in glassy surfaces on said vitrified beads.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) as applied to Claim 11 and in further view of Cai et. al. (Phys Rev Lett. 2002 Dec 2;89(23):235501.) Specifically, Berg sets forth the composition of the dispersion as “containing particles that can be converted into alpha alumina in a liquid” while failing to explicitly indicate the said dispersion should necessarily contain at least one material from the indicated group. Cai indicates that “gamma-alumina is known to transform to theta-alumina and finally to alpha-alumina upon thermal treatment”. It would therefore be obvious to one of ordinary skill to choose gamma-alumina as taught by Cai or “alumina” from the immediate list for the particle that can be converted into alpha alumina in the thermal treatment process set forth by Berg.

Claim 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) as applied to Claim 11 above and in further view of Culler (6,521,004).

With respect to Claim 19 and as indicated above, Berg teaches all of the elements of Claim 11 as well as indicating that, "the shaped particles of (the Berg) invention continually fracture to expose fresh cutting surfaces" (C3, L42-44). Accordingly, they may be considered in the present context to be an erodible matrix material. Berg further indicates that said abrasive particles can be combined with cubic boron nitride or diamond in an adhesive coating layer when preparing an abrasive article (C11, L10-20). Berg however fails to indicate that diamond or cubic boron nitride particles should be directly incorporated into the spherical abrasive agglomerates and bound in an erodible matrix material. Culler teaches a method of forming abrasive agglomerate particles by encapsulating abrasive grains in an erodible binder agent. Among the acceptable abrasive grains indicated as being preferred for the immediate process include aluminum oxide, diamond, and cubic boron nitride (C2, L1-12). It is further indicated that incorporating said abrasive grains in the erodible matrix enhances the useful life of a coated abrasive article (C1, L29-31). It would therefore be obvious to one of ordinary skill in the art seeking to enhance the useful life of an abrasive article to directly incorporate oxides, cubic boron nitride or diamond directly into the erodible matrix material or the shaped particles of the Berg invention according to the teachings of Culler.

Regarding Claim 20, Berg indicates that "the thickness of the particles preferably range from about 25 micrometers to 500 micrometers" (C11, L5-7) and that they may further have an aspect ratio of 1:1 with respect to their thickness (C3, L34-38). This disclosure is understood as providing abrasive agglomerates having number average

abrasive particle diameter sizes in the range of about 25 to 500 micrometers. This disclosure alone is understood as providing abrasive agglomerates in the approximate size range of 10 micrometers as indicated in the immediate claim limitation. As further indicated above in the Claim 19 rejection, Berg indicates that the abrasive agglomerates can be encapsulated with aluminum oxide or “oxide materials” and an adhesive to form an erodible composite film on an abrasive article. Berg fails to *explicitly* set forth that the abrasive agglomerates should have diameters less than 10 micrometers or that the erodible composite should be in the form of particles with diameter of less than 60 micrometers.

Culler teaches that the erodible agglomerate particles, discussed in the rejection of Claim 19 above, have a length dimension in the range of about 10 to about 1500 micrometers (C20, L43-46) and consist principally of abrasive particles in an erodible binder. This disclosure is understood to provide for erodible agglomerate particles overlapping with the size range of 20 to 60 micrometers as set forth in the immediate claim. Further, since the erodible agglomerate dimension must be equal to or larger than the abrasive particle constituents, said abrasive particles must be of a size range less than or equal to 10 micrometers for erodible agglomerate particles on the lower end of the size range. Given that Culler sets forth abrasive particle dimensions and erodible abrasive agglomerate dimensions in the range of the immediately claimed invention, said dimensions are considered to be routinely employed in the art. It would therefore be obvious to adapt Berg process to produce abrasive agglomerates and erodible

composite agglomerates in the size range taught by Culler as appropriate for the end user application

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berg (5,984,988) as applied to Claim 11 above and in further view Ramanath (5834,569). Berg teaches all of the elements of Claim 11 while failing to indicate that coloring agents should be incorporated into the abrasive agglomerates in order to identify the particle size of the abrasive particles contained in said abrasive agglomerate. Ramanath teaches a grinding wheel "can be colored according to a predetermined color coding scheme to identify particle size, shape and type of abrasive" (C2, L31-33). It would therefore be obvious to one of ordinary skill in the art to incorporate a color-coding scheme as taught by Ramanath to abrasive particles of the Berg process in order to prevent the use of an incorrect abrasive particle size.

Response to Arguments

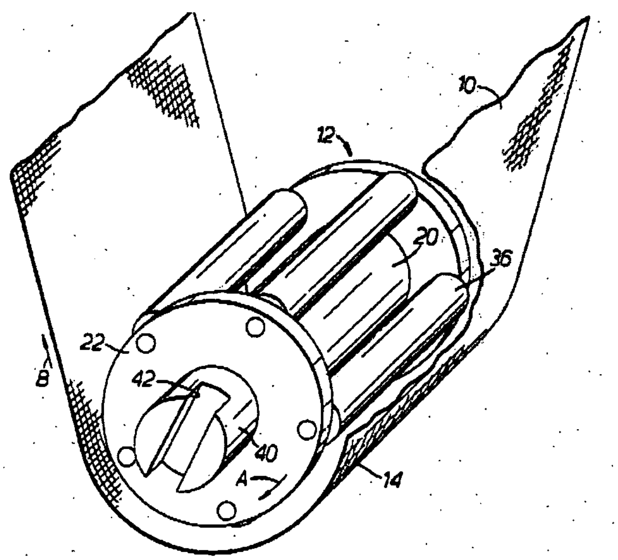
Applicant's arguments filed October 23, 2006 have been fully considered but they are not persuasive.

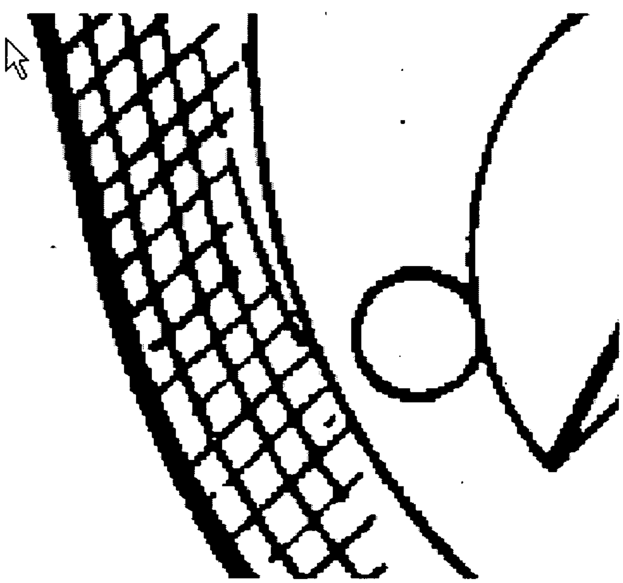
Applicant argues against the teachings of Berg as applied against Claims 2 and 11 in the Office Action dated October 23, 2006 on the grounds that Berg does not teach the formation of "spherical particles', that liquid entities are not ejected from the cell volumes, and that the ejected liquid is not shaped by surface tension into a sphere. It is the Examiners position that all of Applicants arguments have been sufficiently and clearly addressed in the additional explanation as set forth in the rejection of Claim 2 under 35 USC 102(b) above.

With respect to the arguments presented against the rejection of Claim 11, Applicant defines a ***very broad*** range for the green state as between 40 –80 percent solids by weight and that articles in the green state retain their shape and do not adhere to one another. Applicant is directed to the rejections of Claims 2 and 11 under 35 USC 102(b) above for a more detailed treatise on the matters at issue, however in summary it is the Examiners position that;

Berg teaches in a preferred embodiment that the initial slurry is to contain between 50 and 70% solvent by weight (Column 4, Lines 54 to Column 5, Line18). Removal of 40% of this solvent (Column 7, lines 19-26), the maximum preferred under typical operating conditions, provides a "dehydrated" slurry having approximately a 30% to 50% by weight water content (e.g. [40%*(initial water content)]/[(40%*initial water content)+(initial solids content)]. Conversely presented, the slurry still entrained within the mold is approximately 50% to 70% solids by weight. While this solids content does indeed fall within applicants <u>broadly</u> defined "green body" definition of between 40-80% solids, the teaching reference of Zhai et. al., which examines alumina slurries, presents a physical behavior of slurries in this concentration differing from applicant's definition. Specifically, applicant argues that a green bodies "will retain their shape", however Zhai teaches that aqueous alumina based slurries in the 40 to 70 wt% solids content range have sufficient fluidity to be acted upon by surface tension forces. Further, said surface tension forces tend to act upon the wet body to yield a spherical particle. For these reasons, Bergs teaching that the particles can be further dried outside of the mold in fact does read as originally presented in the prior Office Action.

Regarding the argument presented against the rejection of Claims 2 and 11, Applicants argument that a woven screen does not produce individual cell volumes is found to be unpersuasive. Applicant argues that adjacent cell volumes are contiguous and that partially drying a slurry entrained within said volumes would be prohibitive. Eisenberg clearly teaches the formation of individual and isolated cell volumes as depicted in the figure 1 (left original image, right enlarged excerpt near cylinder) excerpt below:





Applicant's arguments against the combination of Culler and Eisenberg with the primary teachings of Berg are found unpersuasive. Specifically, both Culler and Eisenberg teach mold shapes and cell volume geometries that would have been readily evident to one of ordinary skill in the art at the time of the invention. The teachings of Berg stand as presented above in the response to Applicants arguments and in the rejections under 35 USC 102(b) and 35 USC 103(a) above. Further reasons for

combining the analogous art teachings of Culler and Eisenberg with the primary teaching set forth by Berg have been fully set forth above.

Regarding applicants arguments against the rejection of claims 9 and 10, Berg clearly teaches the use of a low-pressure differential to assist ejection of the liquid mold entities followed by a further heat treatment. The presence of a bloating agent in the Matthews reference is in fact not contradictory to the teachings of Berg for the reasons listed in the rejection under 35 USC 103(a) above. Motivation to combine said references has been clearly and unambiguously set forth above.

Applicant is further directed to the specific rejections under 35 USC 102 or 35 USC 103(a) for any arguments not specifically here addressed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL

ERIC HUG
PRIMARY EXAMINER